Volunteer Lake Assessment Program Individual Lake Reports

PEA PORRIDGE POND, MIDDLE, MADISON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	1,856	**Max. Depth (m):**	13.4	**Flushing Rate (yr^{1}):**	5.3
Surface Area (Ac.):	43	**Mean Depth (m):**	4.7	**P Retention Coef:**	0.45
Shore Length (m):	1,400	**Volume (m^{3}):**	831,500	**Elevation (ft):**	636

TROPHIC CLASSIFICATION

Year	Trophic class
1989	OLIGOTROPHIC
2001	MESOTROPHIC

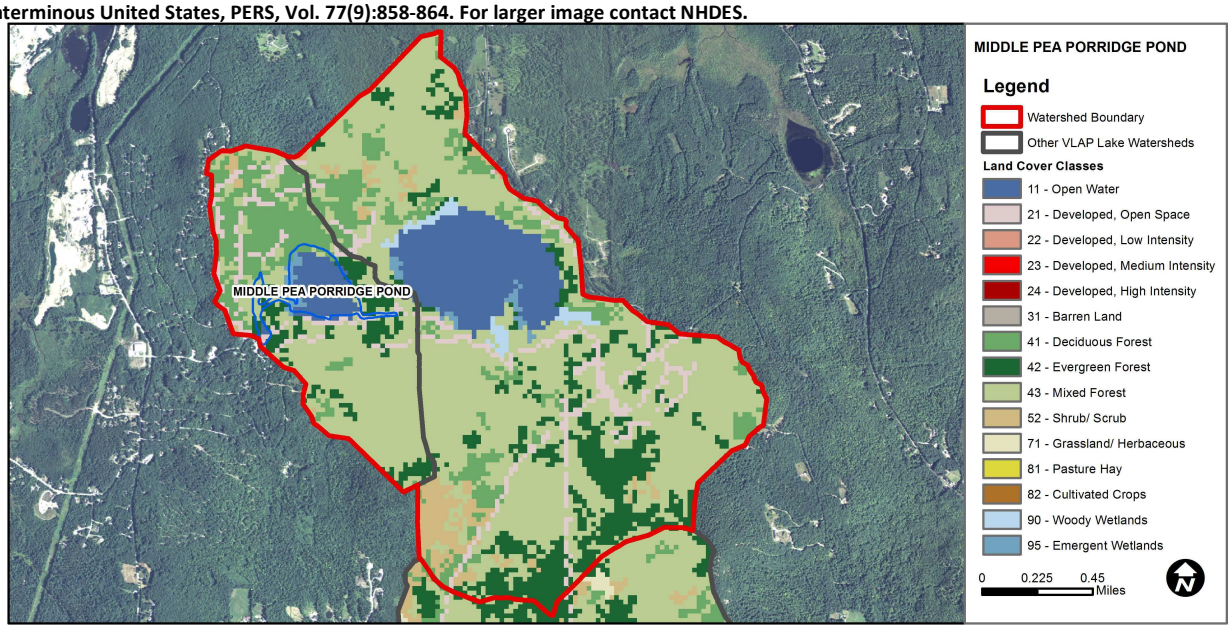
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator and the chlorophyll a indicator is okay.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Slightly Bad	There are >10% of samples (minimum of 2), exceeding criteria.
	Chlorophyll-a	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	10.9	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	6.3	Deciduous Forest	11.92	Pasture Hay	0
Developed-Low Intensity	0.05	Evergreen Forest	13.67	Cultivated Crops	0
Developed-Medium Intensity	0	Mixed Forest	51.2	Woody Wetlands	1
Developed-High Intensity	0	Shrub-Scrub	3.78	Emergent Wetlands	0.86

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Middle Pea Porridge Pond, Madison

2014 Data Summary

Observations and Recommendations (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **Chlorophyll-a:** Chlorophyll levels remained stable and low from June through August. Average chlorophyll levels were low, decreased slightly from 2013 and were much less than the state median. Historical trend analysis indicates relatively stable chlorophyll levels with moderate variability between years.
- **Conductivity/Chloride:** Deep spot and tributary conductivity and chloride were slightly greater than state medians but not above a level of concern. However, historical trend analysis indicates significantly increasing (worsening) epilimnetic (upper water layer) conductivity since monitoring began. Spring chloride sampling indicated slightly elevated chloride levels at stations #1, #15 and #2.
- **E. coli:** Boulder, Eidelweiss and Geneva Beach E. coli levels were much less than the state standard of 88 cts/100 mL on each sampling event.
- **Total Phosphorus:** Epilimnetic and Metalimnetic (middle water layer) phosphorus levels were stable and low from June to August. Average epilimnetic phosphorus levels increased slightly from 2013 but were much less than the state median. Historical trend analysis indicates relatively stable epilimnetic phosphorus with moderate variability between years. Hypolimnetic (lower water layer) phosphorus levels were average in June, increased to slightly elevated levels in July, and then decreased to average levels in August. Inlet phosphorus levels were slightly above average in June and August. Outlet phosphorus levels were low.
- **Transparency:** Transparency measured without the viewscope (NVS) was good in June, increased (improved) in July, and then decreased in August. Average transparency improved from 2013 and was much better than the state median. Historical trend analysis indicates relatively stable transparency with moderate variability between years. Transparency measured with the viewscope (VS) was much better than that measured without and likely a better representation of actual conditions.
- **Turbidity:** Epilimnetic turbidity was slightly elevated in August. Metalimnetic turbidity was slightly above average on each sampling event potentially indicating layers of algae at this depth. Hypolimnetic turbidity increased in July but remained within an average range for that station. Inlet turbidity remained at a slightly higher level throughout the summer but was within an average range for that station. Outlet turbidity was low.
- **pH:** Epilimnetic pH levels were within the desirable range 6.5-8.0 units however metalimnetic and hypolimnetic pH were less than desirable. Historical trend analysis indicates relatively stable epilimnetic pH with moderate variability between years.
- **Recommended Actions:** The worsening epilimnetic conductivity trend is likely a result of winter road salt usage in the watershed. Educate road agents, winter maintenance companies, and homeowners on best practices for road salt application to roads, parking lots, driveways, and walkways. The UNH Technology Transfer Center's Green SnowPro Certification program is a good training opportunity. Visit www.t2.unh.edu/green-snowpro-training-and-certification for more information and educational materials. Overall water quality has remained stable and looks good. Keep up the great work!

Station Name	Table 1. 2014 Average Water Quality Data for MIDDLE PEA PORRIDGE POND									
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m		Turb. ntu	pH
							NVS	VS		
Epilimnion	5.27	1.64	11	60.1		5	4.48	5.08	0.93	6.68
Metalimnion				58.3		6			1.58	6.40
Hypolimnion				67.1		14			1.83	6.11
Boulder Bch					3					
Eidelweiss Bch					6					
Geneva Bch					7					
Inlet				53.3		12			1.66	6.71
Outlet				68.0		5			0.75	6.60

Station Name	Table 2. MIDDLE PEA PORRIDGE POND CHLORIDE DATA
	Chloride mg/l
#1 Eidelweiss Dr	25
#1a	17
#13 Little Shore Dr	21
#15 Middle Shore Pl	31
#2 Eidelweiss Dr	49
#4 Middle Shore Pl	21
Lot 73 Eidelweiss Dr	11

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: > 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: between 6.5-8.0 (unless naturally occurring)

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Worsening	Data significantly increasing.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
pH (epilimnion)	Stable	Trend not significant; data moderately variable.	Transparency	Stable	Trend not significant; data moderately variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.